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Fight Fire Blight of Apple

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Fire blight is one of the most destructive apple diseases found in Wisconsin orchards. It often kills the trees entirely or injures them so severely that they require years to recover from the attack. Outbreaks of fire blight are relatively more severe when the weather is warm and rainy or cloudy at blossoming time, or during the period when the young wood grows rapidly. Pear trees, quince bushes, wild crabs, and some ornamentals belonging to the apple family are also affected by fire blight. The disease is known under different names, as fire blight, pear blight, blossom blight, twig blight, fruit blight, canker blight, and canker and collar blight, according to the tree or part attacked.

A Badly Blighted Apple Tree
Blight affects some varieties more than others. Transcendent crab and other badly blighting varieties should be avoided.

Cause of Fire Blight

Fire blight is caused by bacteria which get into the young growing tissues through the nectaries (the part of the flower containing nectar) in the blossoms or through wounds made in young twigs by insects, or into larger branches through wounds made by pruning tools. Once in the growing part of the wood where there is plenty of moisture, the bacteria increase rapidly in number and kill all the parts they invade leaving

them shriveled and dark colored. When the young wood and bark are soft, as in spring and early summer, the bacteria work rapidly down the twigs or shoots into the larger limbs or trunks where cankers are formed. These cankers are known as "hold-over cankers" because it is at their edges, where the tissue does not dry out, that the bacteria are kept alive over winter. When

FIG. 2.—BLIGHTED AND HEALTHY BLOSSOMS

Fire blight leaves the blossoms brown, withered, and killed.

the sap starts in the spring, the few bacteria which are alive multiply rapidly and form little pockets in the cankers next to the live bark. In rainy weather they come to the surface through the bark lenticels, or cracks, and are ready to spread the disease.

SYMPTOMS OF FIRE BLIGHT

Fire blight has some very striking symptoms:

1. Brown blossoms accompanied by a withering and blackening of the young fruit and fruit spurs.

2. Sweetish, sticky, milk-white or brownish ooze which in rainy weather comes from the freshly blighted parts and cankers. It attracts insects which distribute the disease germs.

3. Black or dark brown leaves which are withered after the disease has passed through them but which for some time cling to the trees. Affected trees have the appearance of having been swept by fire, hence the name "fire blight."

4. Shriveled and blackened bark on the blighted twigs and suckers.

5. Cankers on the larger limbs or trunks. These cankers are usually slightly sunken and blackened and have their bark rough and cracked along the edge between the diseased and healthy wood.

6. General yellowing and dwarfing of the leaves in the growing season, and premature dropping from one or more of the larger limbs. This is frequently due to blight attack at the base of the trunk, a form of the disease which is known as "collar blight." The bark over the collar blight has a watersoaked appearance in mid-summer. Similar yellowing of the leaves may also be caused by anything which interferes with the nourishment of the tree as lack of food or by black rot canker, scab, or winter injury.

FIG. 3.—A BLIGHTED APPLE TWIG

Blight is very severe on young, rapidly growing wood; the leaves becoming black.

HOW TO CONTROL FIRE BLIGHT

Fire blight is one of the most difficult orchard diseases to control. The pruning knife, properly used, is the only direct weapon against it. Blight cannot be controlled by spraying or protective washes. But these help to keep in check insects which carry the blight. Sprays, therefore, may be indirectly helpful in fighting the disease.

THE TEN COMMANDMENTS OF FIRE BLIGHT CONTROL

1. Cut out thoroughly all hold-over cankers. This should be done in the dormant period and is more easily done by removing the blighted branches well below the points where the last signs of the disease occur. If the branch is large and forms a part of the frame work of the tree, it may be saved by cutting away only the diseased portion. In such cases remove all the dead wood and bark back into the bright wood and leave the wound smooth. The wound heals more readily if the bark about the edges is trimmed with a sharp knife held in making the cut at right angles to the branch. The lower part of the cut should come to a point like the bottom of a "V" in order to provide good drainage. This precaution makes the wound less liable to heart rot. To make sure that the cankers are all removed, it is necessary to go over the orchard several times, approaching the trees from a different angle each time.

2. Treat the wounds on the large limbs and trunks by disinfecting them with a solution of corrosive sublimate made as follows: one part corrosive sublimate to 1000 parts water. Convenient-sized tablets of corrosive sublimate may be obtained from any drug store with the directions for making the solution. Keep in glass jars or stone jugs because the solution corrodes metals. It is a deadly poison if taken internally and must be kept from children and animals. After the wounds are dry, paint them with a good white lead and oil paint. If desired, a little lamp black may be added to the paint for the appearance.

3. Prune out new infections promptly and in case of suckers or small branches, cut a foot or more below the blackening of the bark because the bacteria work farther under the bark than its appearance indicates. It is especially important to go over young orchards frequently to remove the blight before an

epidemic has time to start. In case of a blight epidemic in blossoming orchards, the prompt removal of all blighted parts may be impractical. In such orchards, it is important to be sure that all hold-over cankers are destroyed.

4. Disinfect the pruning tools after each cut by wiping them with a clean cloth wet in the corrosive sublimate solution. This destroys any blight bacteria that might be carried on the saw or knife.

5. Burn blighted material promptly because in damp weather the bacteria remain alive in it for some time.

6. Remove suckers on trunks and large branches as soon as they appear; they are especially liable to blight and give rise to cankers and collar-blight forms of the disease.

7. Avoid forcing sappy wood growth by too frequent cultivation or too heavy applications of manure and nitrogenous fertilizers because the blight bacteria work most rapidly and severely on such wood.

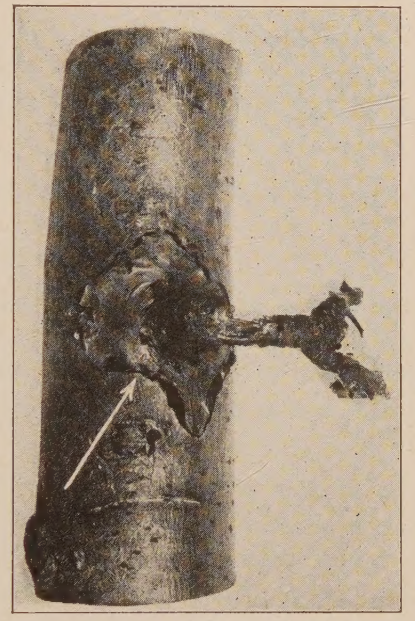

FIG. 4.—TWIG BLIGHT AND CANKER

The blight bacteria gain entrance through blossoms spurs and twigs. Hold-over cankers are dangerous; cut them out.

8. Do not set Transcendent crab because it is especially susceptible to blight under Wisconsin conditions. Yellow Transparent and some other Russian varieties are also more or less susceptible.

9. Kill noxious insects which spread blight, of which aphids are the most important. Bees should not be poisoned because they gather honey but lice and other insects can be destroyed. For the majority of these pests this can best be done by the use of nicotine sulphate (''Black leaf 40''), 1 part to 1000 parts of water or other spray liquid. Combine the tobacco solution with the regular spring and summer sprays, or with water in case no

other spray is desired. When used with water alone, add laundry soap, 2 pounds to 100 gallons. This greatly increases the spreading qualities and effectiveness of the remedy.

10. Cooperate with all your neighbors in cleaning up old orchards, inspecting and pruning. The tenth commandment is very important. Fire blight control is a matter for community, as well as individual, effort.

Other Orchard Diseases

Fire blight is only one of several diseases with which the Wisconsin orchardist must contend.

Do not confuse it with the following troubles each of which requires different treatment.

Apple scab. Black spots and cracking of fruit, spotting and curling of leaves.

Spray with Bordeaux mixture or lime sulfur.

Apple rust. Yellow spots killing leaves. Worst on Wealthy. Starts as galls on red cedar and spreads from this to the apple.

Destroy all red cedars near the orchard and do not plant Wealthy apples in regions where the red cedars cannot be exterminated.

Winter injuries. Sun scald on the southwest side of the trunk or larger limbs of young trees is the commonest form. Crotch canker and crown rot are other kinds of winter injury.

Whitewash or shade the south side of the trunk. Avoid over fertilization and late summer cultivation. Use cover crops to mature wood in autumn.

For detailed advice about these or any other orchard or crop pests write to College of Agriculture, University of Wisconsin, Madison.

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